8.101 F

NORDMENDE

Service

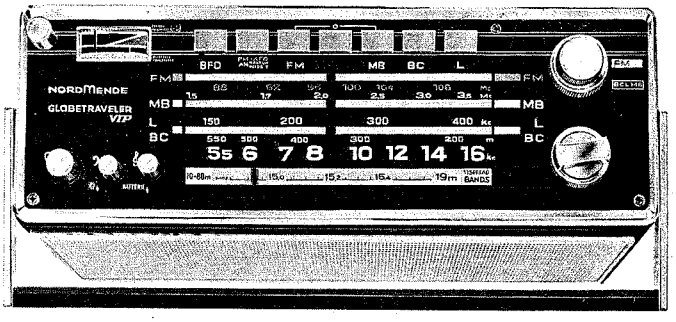
Transistor Portable

Chassis-No. 768.101 F

Globetraveler VIP

Technical Data:

Power:	5 flashlight cells of 1,5 V each or car battery 6/12 V resp. or built-in power unit 110/220 V or external power supply 7,5 V
Consumption:	approx. 10 W with operation on built-in power supply unit and max. output (1 kc) approx. 70 mA at 50 mW output. (1 kc sine)
Fuse:	2×0,05 A long time lag
Transistors:	4× AF 106, 2× AF 125, 4× AF 126, AF 137, AC 122, BC 109 cf, AC 163, 2 AD 155, AC 117
Diodes and Stabilizer:	4× AA 112, 2× AA 118, BA 111, 0,8 St 80, St 2,1—0,7/10 S, 2× BA 170, ZD 8,2, B 30 C 450 Kb.
Total-Circuits	7 AM 2 variable by C 13 FM 2 variable by L 12 SW-bands 3 variable by C
IF-Circuits:	5 AM — 460 kc 10 FM — 10,7 Mc SW-bands: 4 AM circuits additionally
Ranges:	FM 88 ... 108 Mc MW 515 ... 1650 kc LW 145 ... 420 kc SW 1,5 ... 3,65 Mc 10-, 11-, 13-, 16-, 19-, 20-, 25-, 31-, 41-, 49-, 80-m-band.
Push-Buttons:	7 (5 range button, 1 AFC with Bandwith, 1 BFO-button)
Switches:	4 (ON/OFF, illumination, battery-test, band selector.)
AVC:	AM effective at 1rst IF-stage (double) and 2nd IF-stage and at SW-bands also at RF-stage.
Antenna:	ferrite antenna for BC, L, telescope antenna (extendable in two main sections) for SW-bands, MB and FM.
Connecting sockets:	standardized PU/TR socket, 1 outside speaker/earphone socket, car mount, antenna/ground, external power supply 7,5 V, mains supply 110/220 V.
Tone Control:	bass-, treble control.
Negative feedback:	multiple negative feedback in AF-amplifier, sound network at AF-prestage.
Speaker:	permanent dynamic 130×180 mm, 3,5 Ω.
Max. Power-Rating:	2 W, car operation 4 W.
Cabinet:	wood, leatherette covered. width 31 cm height 21 cm depth 10,5 cm



Type 968.101.F

Special Features:

4 mesa transistors at SW and FM-tuner, 11 spread SW-bands, 3-knob-tuning. Dial illumination by depressing treble control button. Permanent dial illumination if operated with external (7,5 V) or built-in (110/220 V) power supply. Large indicator instrument. Battery test by depressing the treble control button. Extra long (130 cm) telescope antenna, extendable in two different steps. AM-variometer tuning at car operation (MW/BC). Selective tuned RF-stage at SW-bands. Drum dial for SW-bands. Built-in power unit 110/220 V. Enclosed container box for mains cord. Band-spread switch for AM combined with AF low pass and FM-AFC.

On shortwave bands double super with 1. IF 2 Mc/s. BFO for telegraphie resp. SSB. SSB fine tuning by AM tuning knob. By BFO key simultaneously switching from automatic to manual volume control and full audio frequency amplification. The control by hand is coupled mechanically with the volume control knob. The short wave ranges are spread differently so that the total length of dial may be utilized on the respective band. The 10-m-band has been enlarged up to 26,8 Mc/s for the "citizen-band".

In connection with car mount 968.180 A: automatically connected to car battery (6/12 V reversable), to the car antenna and car speaker. Dial illumination permanently illuminated if set is switched on. Automatically switched to 4 W output.

Alignment-Procedure

A) Operating point of output stage

Volume control fully counterclockwise, no input signal applied. Measure current of the common collector-lead at point a, and adjust to 6 mA with control **R 505.**

B) IF-Alignment

AM-IF 460 kc

Depress button BC, turn tuning capacitor fully outwards. Bandwidth button into position „narrow".

Alignment using Sweep-Generator

Connect sweeper output via balun (winding-ratio 3:1) to **point b and ground.** Connect oszilloscope via low-pass filter (1,5 kΩ/4,7 nF) **to point c and ground.** Response curve: adjust AM-circuits **X ... XIV** to maximum and best symmetry. Depress bandwidth button and check response curve. If resulting curve is now unsymmetrical, the alignment procedure must be repeated in position "narrow".

Depress BFO key, turn on volume control half way. Reduce IF level at sweep generator output as far as possible. Adjust **BFO (L 185/186)** on the center of the selectivity curve.

Alignment using signal-generator

Connect outputmeter across voice coil of speaker. Connect generator via 0,22 µF capacitor to **point b and ground.** Adjust AM-circuits **X ... XIV** to maximum output (460 kc). Bandwith button in position "wide band". Detune generator 3 kc to both sides of 460 kc. Deflection of meter pointer must be equal to both sides. (Repeat alignment — in position "narrow" — if necessary.)

Depress BFO key, turn on volume control half way. Reduce IF level at signal generator output as far as possible. Adjust **BFO (L 185/186)** for zero beat.

FM — IF 10,7 Mc

Depress button FM, dial pointer to be at **108 Mc.** Key AFC disengaged.

Alignment using Sweep-Generator

Connect sweeper output via balun (ratio of turns 3:1) by the aid of a handmade clamping device as shown in sketch, to the FM-tuner. Connect oscilloscope via 1 pF capacitor to **point d and ground,** or in parallel to **point 1 and 6 of BF XIV.** Adjust BF **VI ... I** and primary of BF **V** to maximum and best symmetry of response curve. Next adjust secondary of **BF V** for energy-draw. Disconnect sweeper from point **(6)** and connect to **point (e)** to align ratio curve. Adjust RF output to a level that limiting of curve does not occur. Adjust ratio (S-curve) with secondary of **BF V** for best symmetry and primary of **BF V** for best slope steepness of S-curve. Thereafter adjust **R 271** for minimum noise content. Check ratio symmetry and repeat alignment of **BF V** if necessary.

Alignment using Signal-Generator

(Ri = 60 Ω, Frequ. deviation = 22,5 kc)
Connect outputmeter in parallel to voice coil of speaker. Feed generator signal via clamping device (see sketch) to **FM-tuner.** Adjust **RF V ... I** to maximum. Reduce generator output to a level that limiting does not occur. Switch generator to AM-modulation and adjust **BF V** for maximum AM-supression.

C) RF-Alignment FM

Connect signal generator (Ri = 60 Ω) parallel to **telescope antenna** (antenna pushed in). Tune dial pointer to gauge mark at **87 Mc** (if not possible, adjust dial pointer). With generator signal at **87 Mc** adjust **C 74** to maximum. Signal generator to **99 Mc** (≙ 71 mm dial movement). Adjust now **C 62** to maximum. With signal generator and receiver turned to **88 Mc** check alignment position of intermediate circuit trimmer **C 62.** Does the resulting maximum output level change only to a small amount, the alignment is good. If the output level changes to a greater amount, the alignment has to be carried out again in the following manner:

Turn dial pointer to **87 Mc** gauge mark (if not possible, adjust dial pointer). Turn dial pointer to **108 Mc.** In this position adjust variometer core as shown in sketch.

Tune signal generator and receiver to **87 Mc** and adjust **C 74** to maximum output. Turn receiver to gauge mark **99 Mc** (≙ 71 mm dial movement). Signal generator frequency **99 Mc.** Adjust **L 70** to maximum output. Repeat alignment of **C 74** at **87 Mc.** At **88 Mc** adjust intermediate circuit trimmer **C 62** and at **99 Mc** adjust intermediate circuit coil **L 61** both to maximum. Repeat alignment of **C 62** at **88 Mc.**

D) RF-Alignment AM

(receiver operating as portable)

a) Medium Wave (BC) 515 ... 1650 kc

Turn tuning capacitor fully inwards. Adjust dial pointer of receiver to gauge mark at end (see sketch). Feed generator signal via coupling loop into ferrit antenna. Set signal generator to **515 kc** and align oscillator coil **L 181/183** to max. With signal generator and receiver set to **1500 kc** ≙ 124,1 mm dial movement has to be adjusted. Align **C 181** to maximum. Repeat alignment, until movement range o.k.

Set signal generator and receiver to **555 kc** and adjust FA-prestage coil **L 121** to maximum. Set signal generator and receiver to **1500 kc** and adjust prestage trimmer **C 121** to maximum. Repeat alignment until no further improvement possible.

b) **Long Wave:** (145 ... 420 kc)

Feed signal of generator via coupling loop into ferrite antenna. Tuning capacitor fully inward position. With signal at **145 kc** adjust oscillator coil **L 191/193** to max. Turn tuning capacitor in full outward position. With signal generator at **420 kc** adjust oscillator trimmer **C 191** to max. Repeat alignment until no further improvement possible.

Set signal generator and receiver to **160 kc** and align FA-prestage coil **L 125** to max. Now tune generator and receiver to **390 kc** and align prestage trimmer **C 125** to max.

Repeat alignment, until no further improvement possible.

c) **Short-Wave** (MB) : (1,5 ... 3,65 Mc)

Connect signal generator via 10 pF capacitor to pushed-in telescope antenna. Tuning capacitor of receiver fully inwards. Signal generator frequency to **1,5 Mc.** Adjust oscillator coil **L 175/177** to max. Turn tuning capacitor fully outwards and signal frequency to **3,65 Mc** and adjust **C 176** to max.

Repeat alignment until no further improvement possible.

For prestage alignment set frequency of generator and receiver to **1,6 Mc and adjust L 115/116** to max.

Repeat alignment until no further improvement possible.

For RF-alignment of SW-tuner see backpage of circuit diagram of the coil-gang.

RF-AM Alignment

(receiver operating as car radio)

Put switch into position car reception by switching pin as being used in car mount. Short-cut pin 5 and 6 of the multiway connector **V 591.** Output meter in parallel to voice coil of speaker.

a) Medium Wave

Connect signal generator via dummy antenna 16/60 pF (see sketch) to pin **(1)** and **(4)** of the multiway connector **V 581.**

Preliminary alignment of AM-variometer.

(Only necessary, if variometer has been exchanged or detuned.)

Disconnect lead to **point 1** of variometer. Connect signal generator via dummy antenna 16/195 pF (see sketch) to **point 1.** At **550 kc** adjust variometer **L 153/154** with set screw to max. Resolder disconnected lead to **point 1.**

Tune signal generator and receiver to **555 kc** and adjust prestage trimmer **C 153** to max. Tune generator and receiver to **1500 kc** and adjust prestage coil **L 152** to max.

Repeat alignment util no further improvement possible.

b) Long-Wave

Connect signal generator in the same manner as on **MW (BC).** Tune signal alignment and receiver to alignment frequency of **145 kc** and adjust RF-coil **L 160/162** to max. Now tune generator and receiver to alignment frequency **420 kc.** Adjust RF-Trimmer **C 160** to max. Repeat alignment until no further improvement possible.

c) Short-Wave (MB)

Check function only, no alignment required.

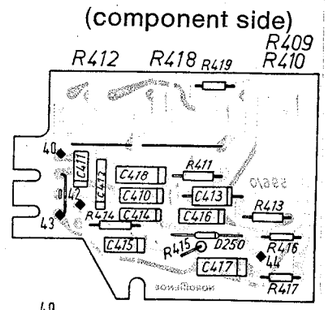
Stated voltages at FM at AM are measured at the corresponding circuit component!

Red print = soldered side.

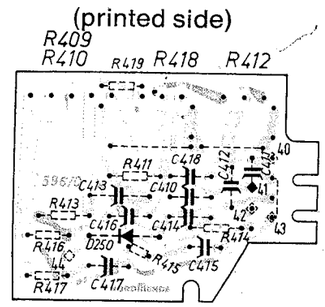
Black print = component side.

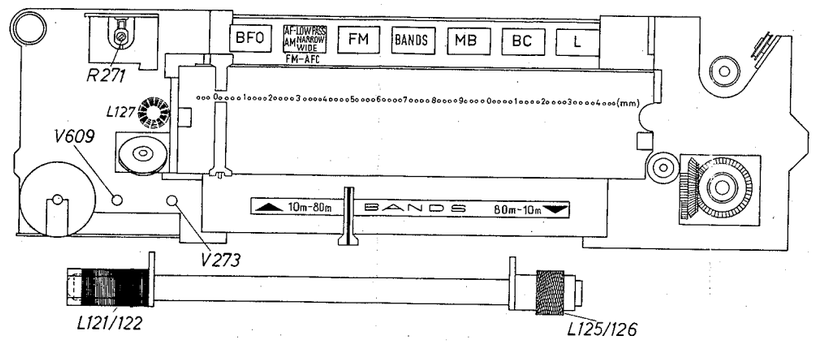
Tone control board 524.613.29

(component side)

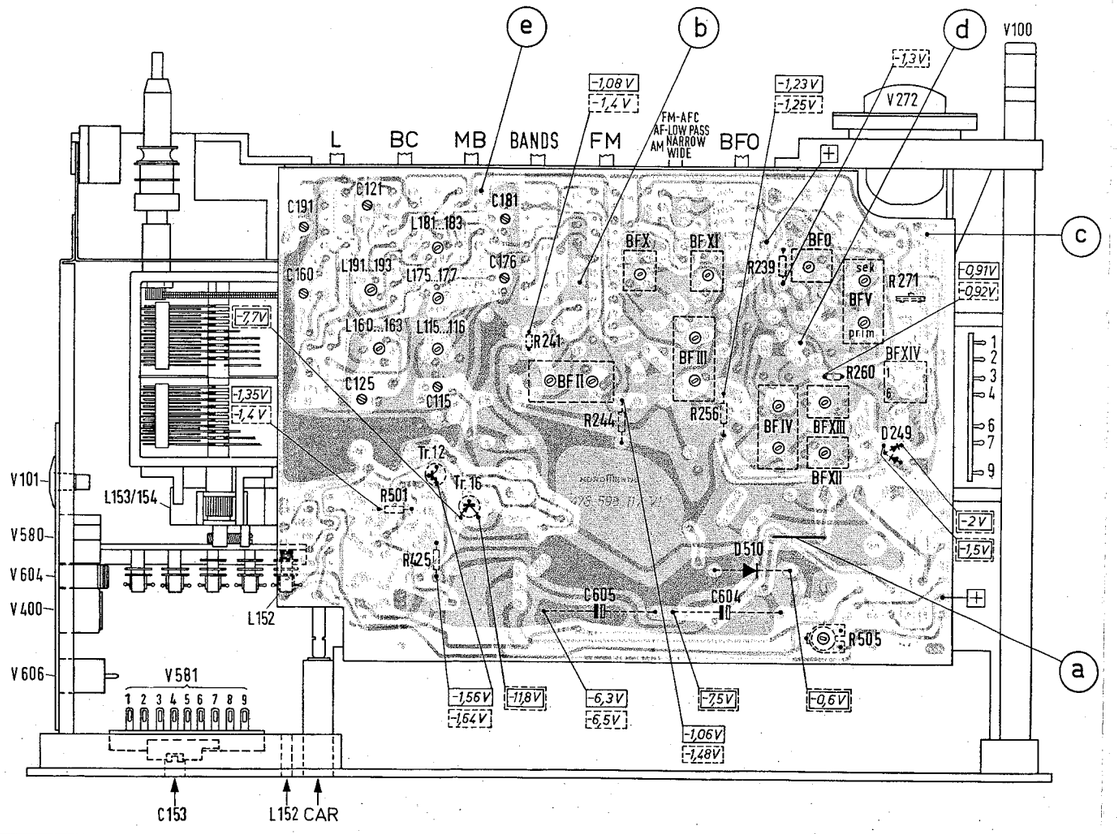


(printed side)

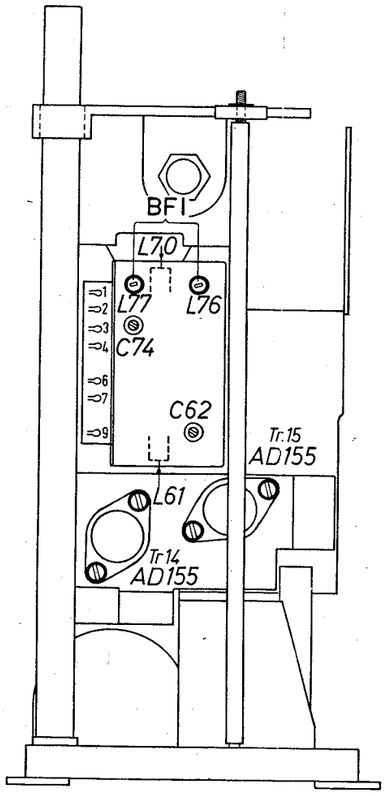


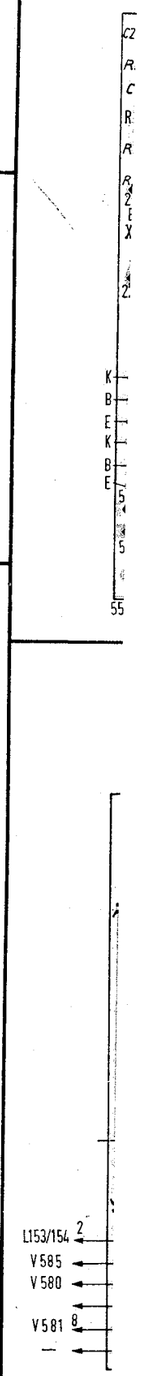


Position of alignment points



FM-tuner position of alignment points





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91. Output meter in parallel to voice coil of

6/60 pF (see sketch) to pin **(1)** and **(4)** of the

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and adjust prestage trimmer **C 153** to max.
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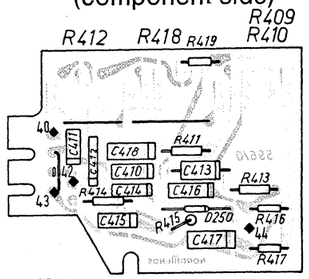
as on **MW (BC).** Tune signal alignment and
adjust RF-coil **L 160/162** to max. Now tune
420 kc. Adjust RF-Trimmer **C 160** to max.
ossible.

AM are measured at the
onent!

de.

Tone control board 524.613.29

(component side)



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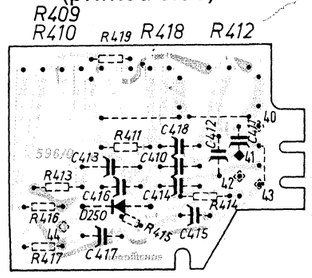
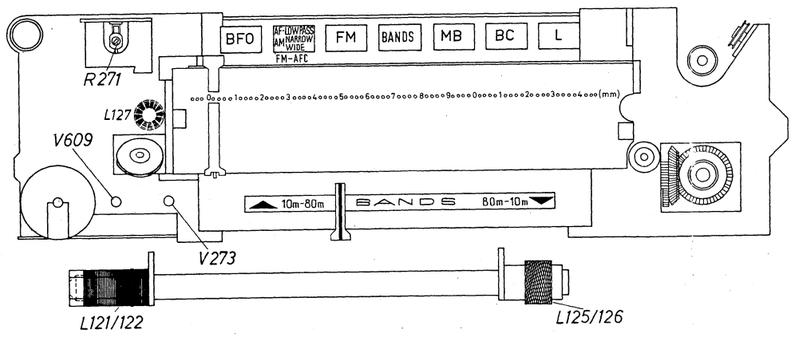
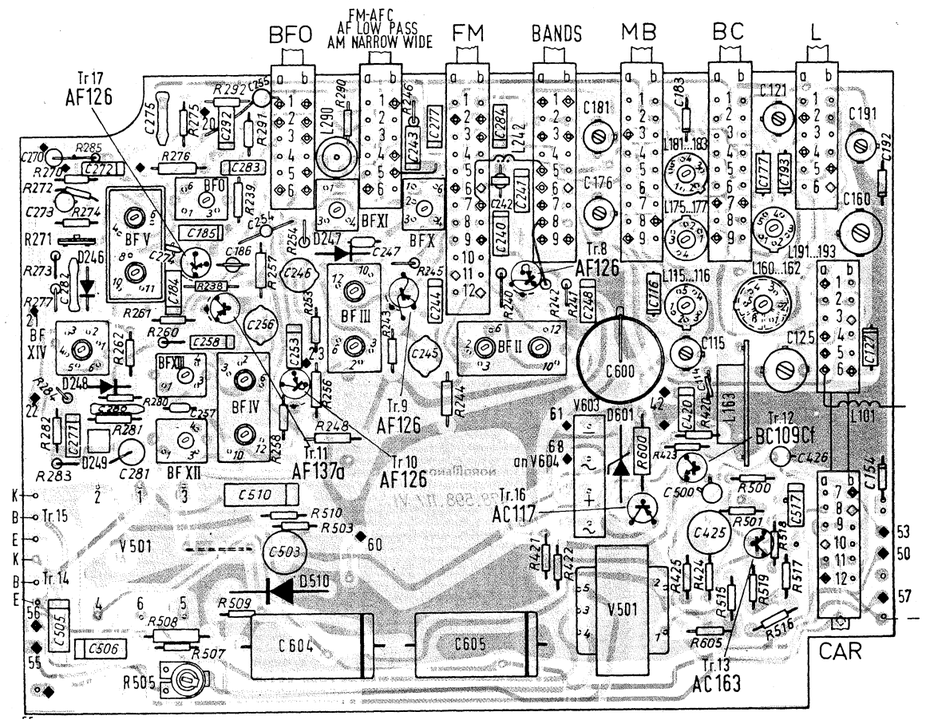


40 ◆ connection points

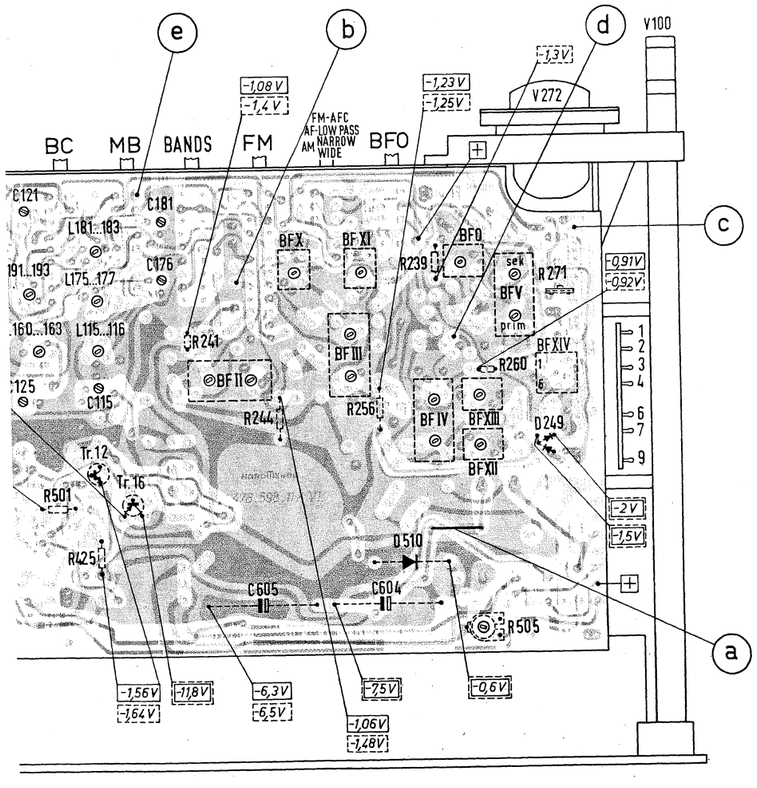


Printed circuit board 524.614.29

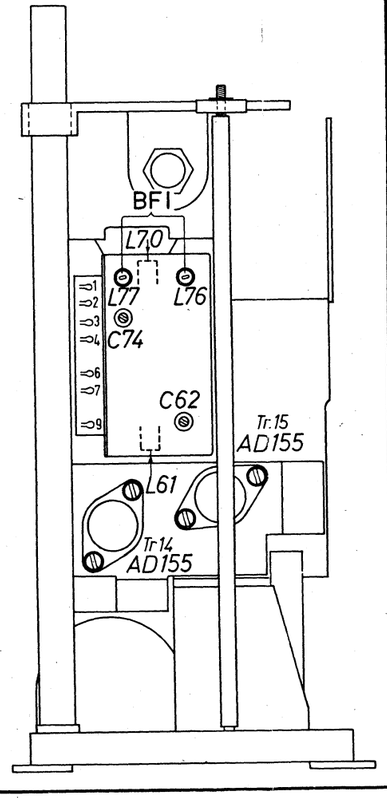
(component side)



Position of alignment points

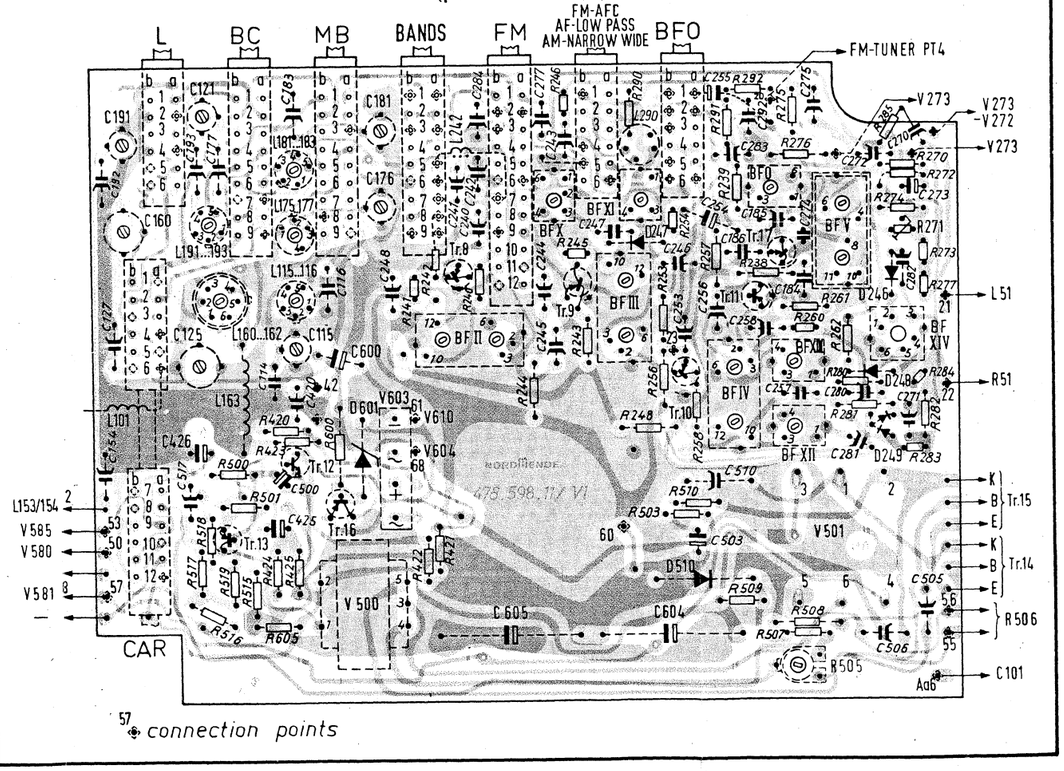


FM-tuner position of alignment points

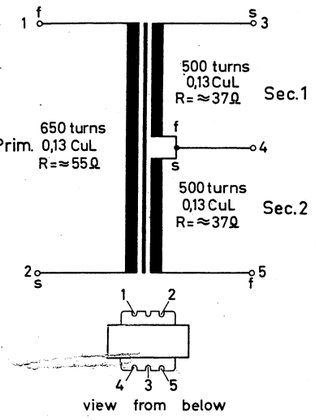


Printed circuit board 524.614.29

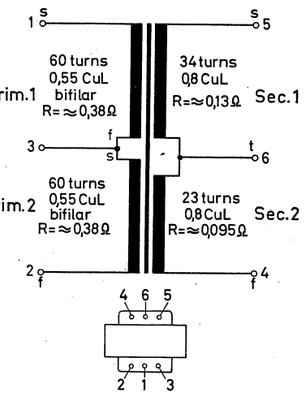
(printed side)



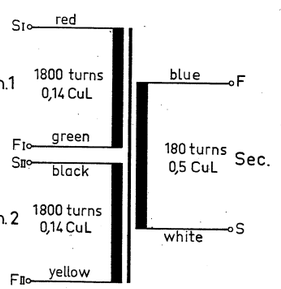
Input Transformer 522.076.13



Output Transformer 522.071.13

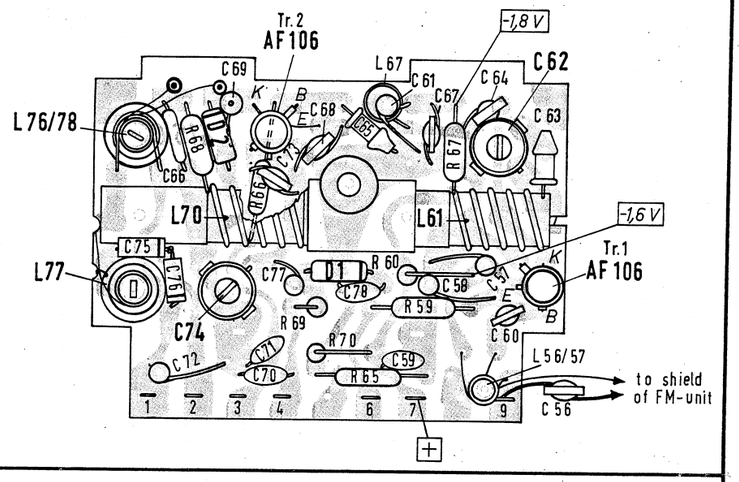


Mains Transformer 521.137.23

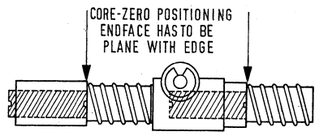


FM-printed-board 580.078.29

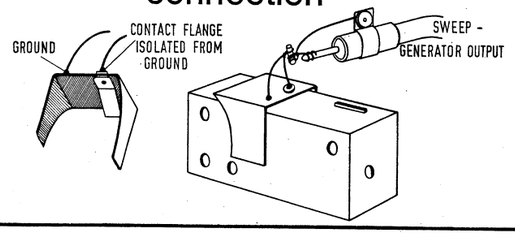
(component side)



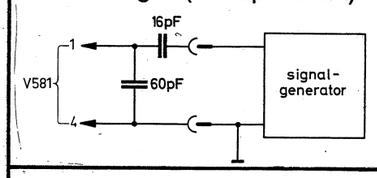
Adjustments of FM-Variometer-cores



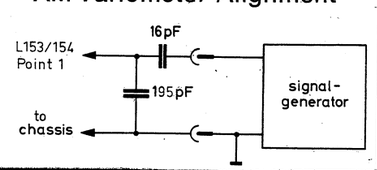
Clip-termination for FM-Sweep-signal connection

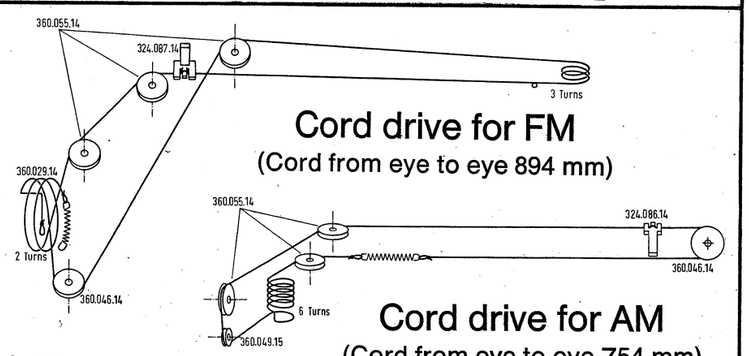


Dummy antenna for alignment of RF-stages (car operation)

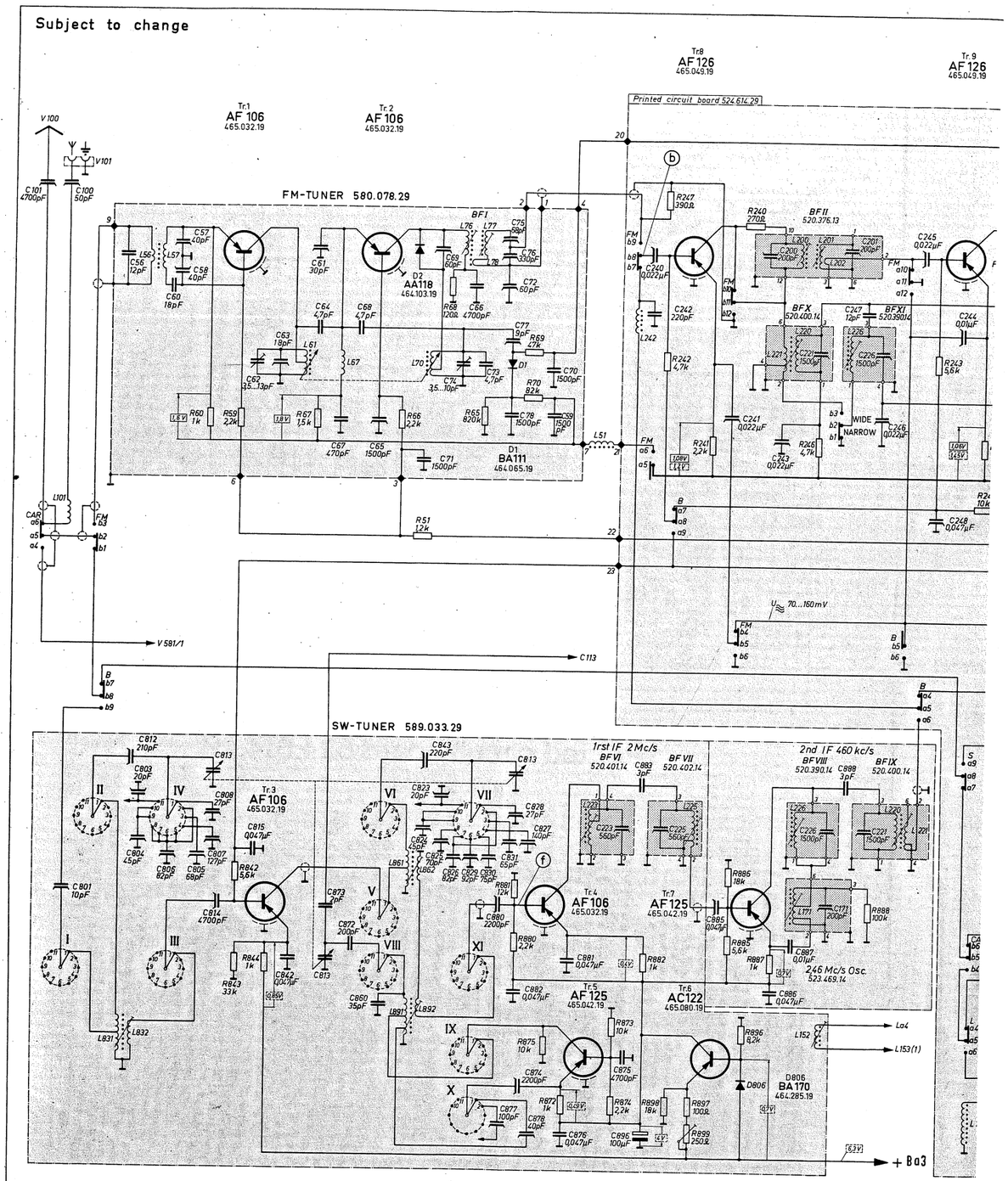


Dummy antenna for AM Variometer-Alignment





Subject to change

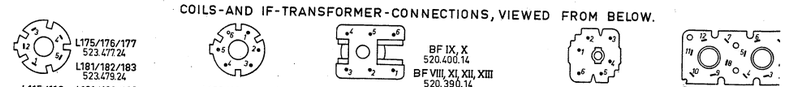


RANGES:

FM	88 ... 108 Mc/s
MW	515...1650 kc/s
LW	145 ... 420 kc/s
SW	1,5 ... 3,65 Mc/s

10-,11-,13-,16-,19-,20-,
25-,31-,41-,49-,80-m band.

COILS-AND IF-TRANSFORMER-CONNECTIONS, VIEWED FROM BELOW.



SW-BANDS TUNER — See additional diagram

TRIMMING CONDENSER

C	113	62	74		115	121	125	153	160	176	181	191		600
	fun.cond. 446.854.13	3,5...13pF 447.055.15	3,5...10pF 447.078.15		6...30pF 447.085.15	6...30pF 447.085.15	10...80pF 447.060.15	15...100pF 447.085.14	10...80pF 447.085.15	6...30pF 447.085.15	6...30pF 447.085.15	6...30pF 447.085.15		1000pF 443.128.19

ADJUSTABLE RESISTORS

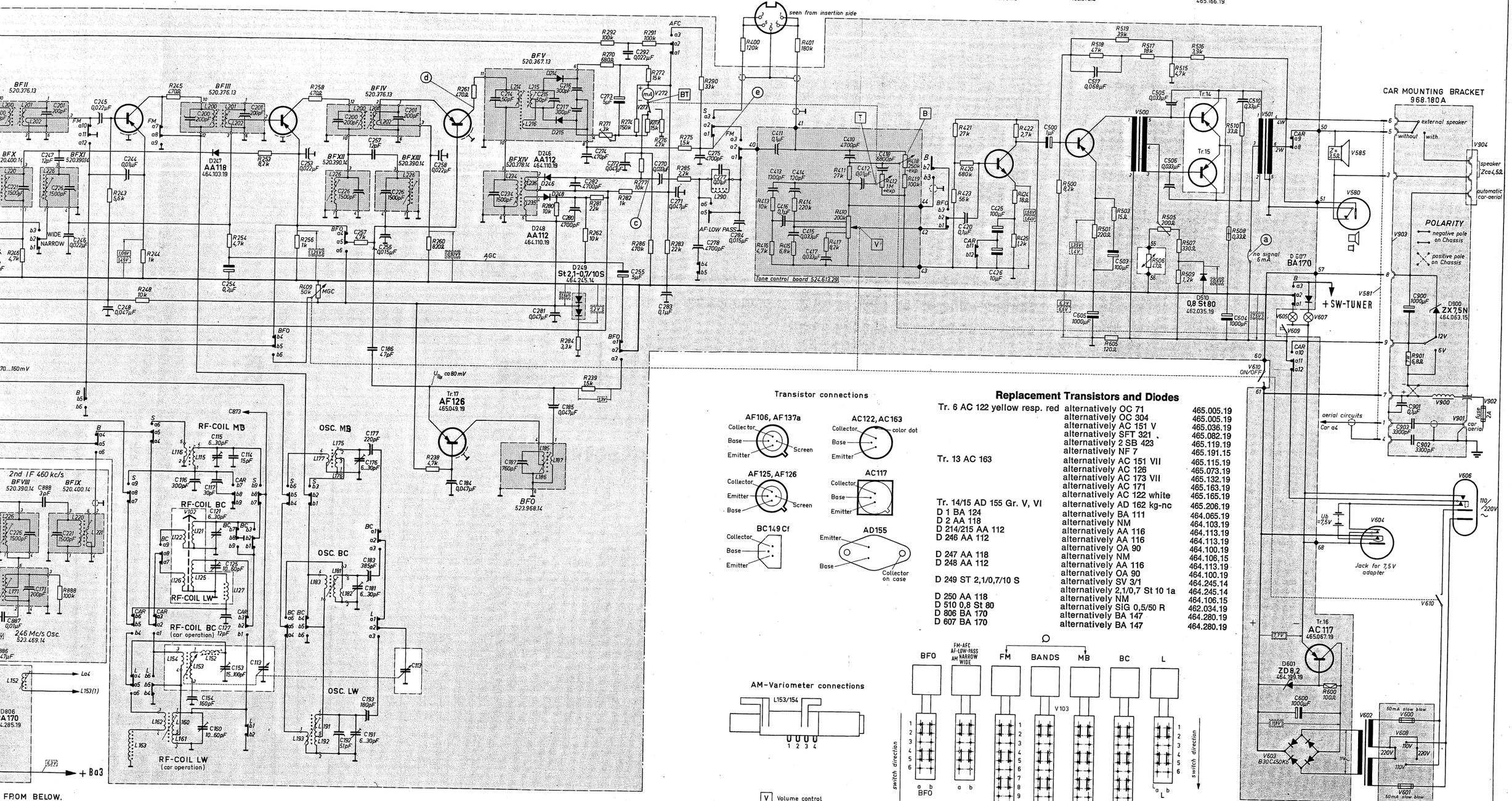
R	271			409	410	412	418		505	506	NTC
	3 k 402.709.16			50 k 402.677.16	200 k 402.677.16	1 M 402.693.16	250 k 402.694.16		100 Ω 402.275.15	470 Ω 402.015.15	

L	51		56	57	61	70	67	76	77	78		101		115	116	121	122	125	126	127		152		153	154		160	161	162
	15 µH 423.505.15		W I	W II	FM-Variometer 523.265.14			BF I 473.398.15	BF I 424.406.25	BF I 424.406.25				W I	W II 523.478.24		W I	W II 424.331.24	W I	W II 424.331.24		SW-BANDS TUNER		W I	W II 424.080.24		W I	W II 523.476.24	W III
			423.134.25				420.492.25					424.355.25									423.120.24							

V	100	101	102	103	104	272	273	400	500	501	502	503	580	581	585	600	601	602	603	604	60
	Telescopic anten. 475.616.14	Antenna jack 174.319.14	Ferrite rod 466.090.15	switch 472.580.13		Indicator instrum. 475.008.13	Battery-test switch comb.with AU12	Fh.-T.R.-jack 174.043.14	Input-transformer 522.076.13	Output-transform. 522.071.13	switch 472.546/547.13	switch 472.546/547.13	Speaker jack 174.326.14	Contact-strip 175.073.14	Speaker 470.167.13	Fuse T 0,05 B	Fuse T 0,05 B	Mains-transform. 521.137.23	Bridge rectifier 464.236.19	Connecting socket 176.292.14	Dial 14 7/8

STATED VOLTAGE MEASURED AT FM AM WITH INSTRUMENT 50000Ω/V WITHIN THE 10V OR 3V RANGE. NO INPUT SIGNAL APPLIED. REFERENCE POINT B+. SUPPLY VOLTAGE 7,5 VOLT.

Tr. 9 AF 126 465.049.19 | Tr. 10 AF 126 465.049.19 | Tr. 11 AF 137 465.061.19 | D 214/215 AA 112 (paired) 464.110.19 | Tr. 12 BC 149 Cf 465.081.19 | Tr. 13 AC 163 465.075.19 | Tr. 14/15 AD 155 (paired) 465.166.19

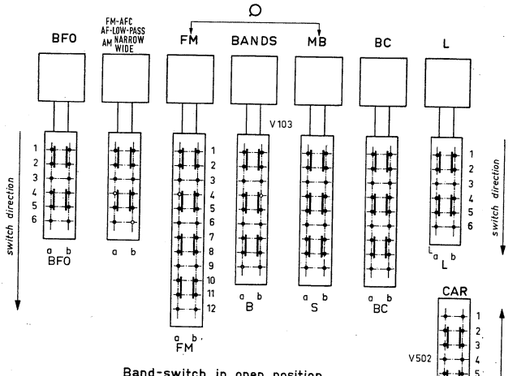


Transistor connections

Replacement Transistors and Diodes

Tr. 6 AC 122 yellow resp. red	alternatively OC 71	465.005.19
	alternatively OC 304	465.005.19
	alternatively AC 151 V	465.036.19
	alternatively SFT 321	465.082.19
	alternatively 2 SB 423	465.119.19
	alternatively NF 7	465.191.15
Tr. 13 AC 163	alternatively AC 151 VII	465.115.19
	alternatively AC 126	465.073.19
	alternatively AC 173 VII	465.132.19
	alternatively AC 171	465.163.19
	alternatively AC 122 white	465.165.19
Tr. 14/15 AD 155 Gr. V, VI	alternatively AD 162 kg-nc	465.206.19
D 1 BA 124	alternatively BA 111	464.065.19
D 2 AA 118	alternatively NM	464.103.19
D 214/215 AA 112	alternatively AA 116	464.113.19
D 246 AA 112	alternatively AA 116	464.113.19
D 247 AA 118	alternatively OA 90	464.100.19
D 248 AA 112	alternatively NM	464.106,15
D 249 ST 2,1/0,7/10 S	alternatively AA 116	464.113.19
D 250 AA 118	alternatively OA 90	464.100.19
D 510 0,8 St 80	alternatively SV 3/1	464.245.14
D 806 BA 170	alternatively 2,1/0,7 St 10 1a	464.245.14
D 607 BA 170	alternatively NM	464.106.15
	alternatively SIG 0,5/50 R	462.034.19
	alternatively BA 147	464.280.19
	alternatively BA 147	464.280.19

AM-Variometer connections

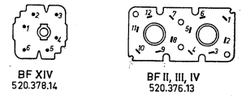


V Volume control
T Treble control
B Bass control
BT Battery-test

41 Printed circuit board connections

— up to 0,125 W
— 0,33 W
— 0,7 W
— 1 W
rating at 70° C

FROM BELOW.



ABLE RESISTORS

10	412	418		505	506	
Ok	TM	250 K		200 Ω	470 Ω	
677.14	402.893.14	402.894.14		401.275.15	404.014.15	

IF-TRANSFORMER

II	III	IV	V	X	XI	XII	XIII	XIV
520.376.13	520.376.13	520.376.13	520.367.13	520.400.14	520.390.14	520.390.14	520.390.14	520.378.14

153	154		160	161	162	163		175	176	177	181	182	183	191	192	193		242		290	
W1	W II		W I	W II	W III			W1	W II	W III	W I	W II	W III	W I	W II	W III					
	424.090.24			523.476.24		424.321.24			523.477.24			523.479.24			523.475.24			423.037.15		523.970.24	

601	602	603	604	605	606	607	608	609	610	611	900	901	902	903	904
Fuse 0,05 B	Mains-transformer 521.137.23	Bridge rectifier 464.238.19	Connecting socked 174.292.14	Dial lamp 7 V 0,1 A	Mains socked 175.117.14	Dial lamp 6 V 0,1 A	voltage selector 175.015.14	switch comb. with R418	On/off - switch comb. with R410		Suppressor choke 521.161.14	Antenna jack 174.172.14	Fuse 467.048.15	Contact strip 174.175.14	ext. speaker sock. 540.929.24

+ SUPPLY VOLTAGE 7,5 VOLT.

CODE FOR POSITION

0 ... 99	FM-TUNER
100 ... 199	AERIAL CIRCUIT STAGE AND OSCILLATOR
200 ... 299	IF-STAGE
400 ... 450	PRE DRIVER STAGE
500 ... 599	DRIVER AND PUSH PULL OUTPUT STAGE
600 ... 615	POWER SUPPLY
800 ... 899	SW-BANDS TUNER
900 ... 905	CAR MOUNTING BRACKET

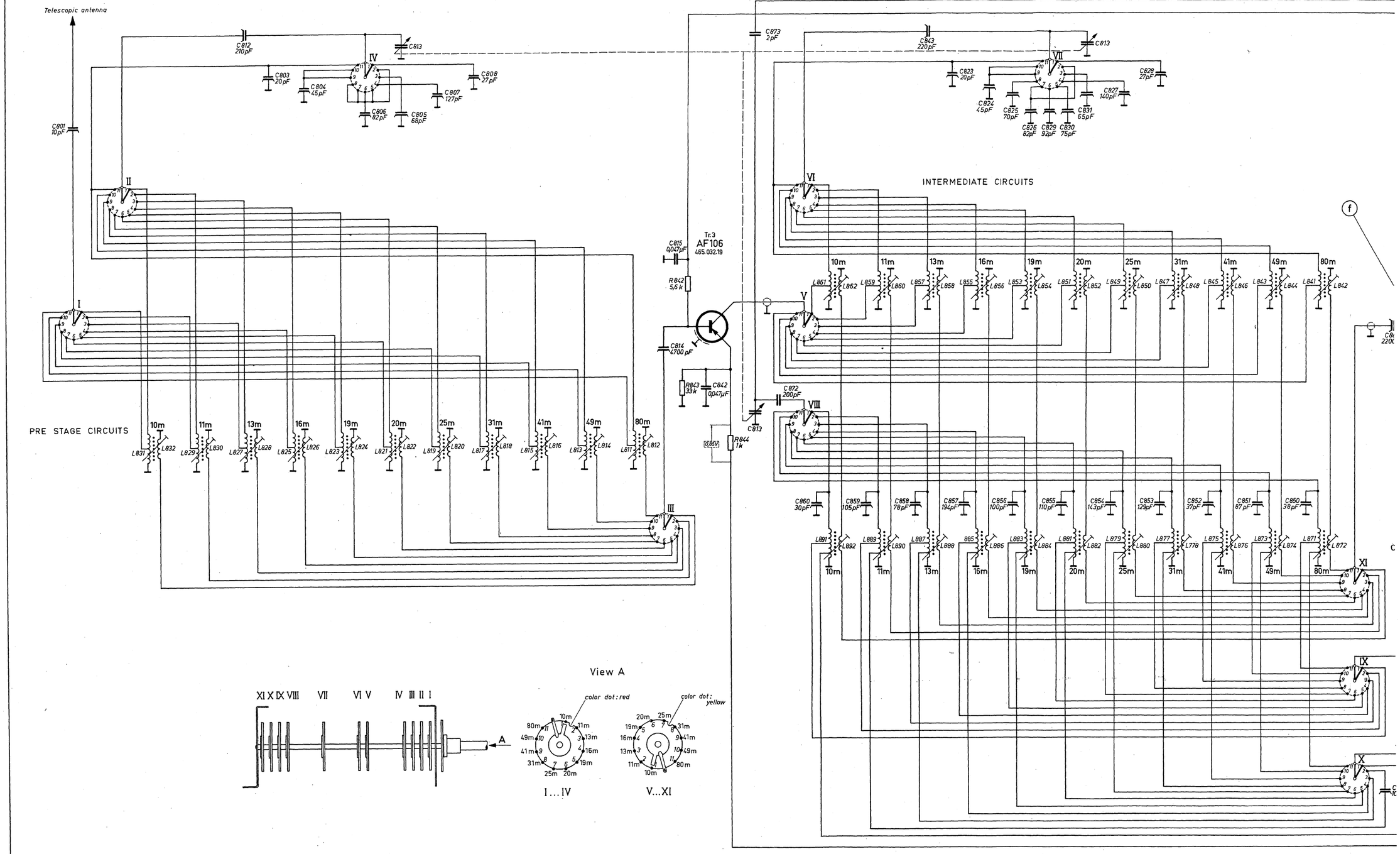
NORDMENDE

Transistor Portable

8.101 F

Globetraveler VIP

184.374.18

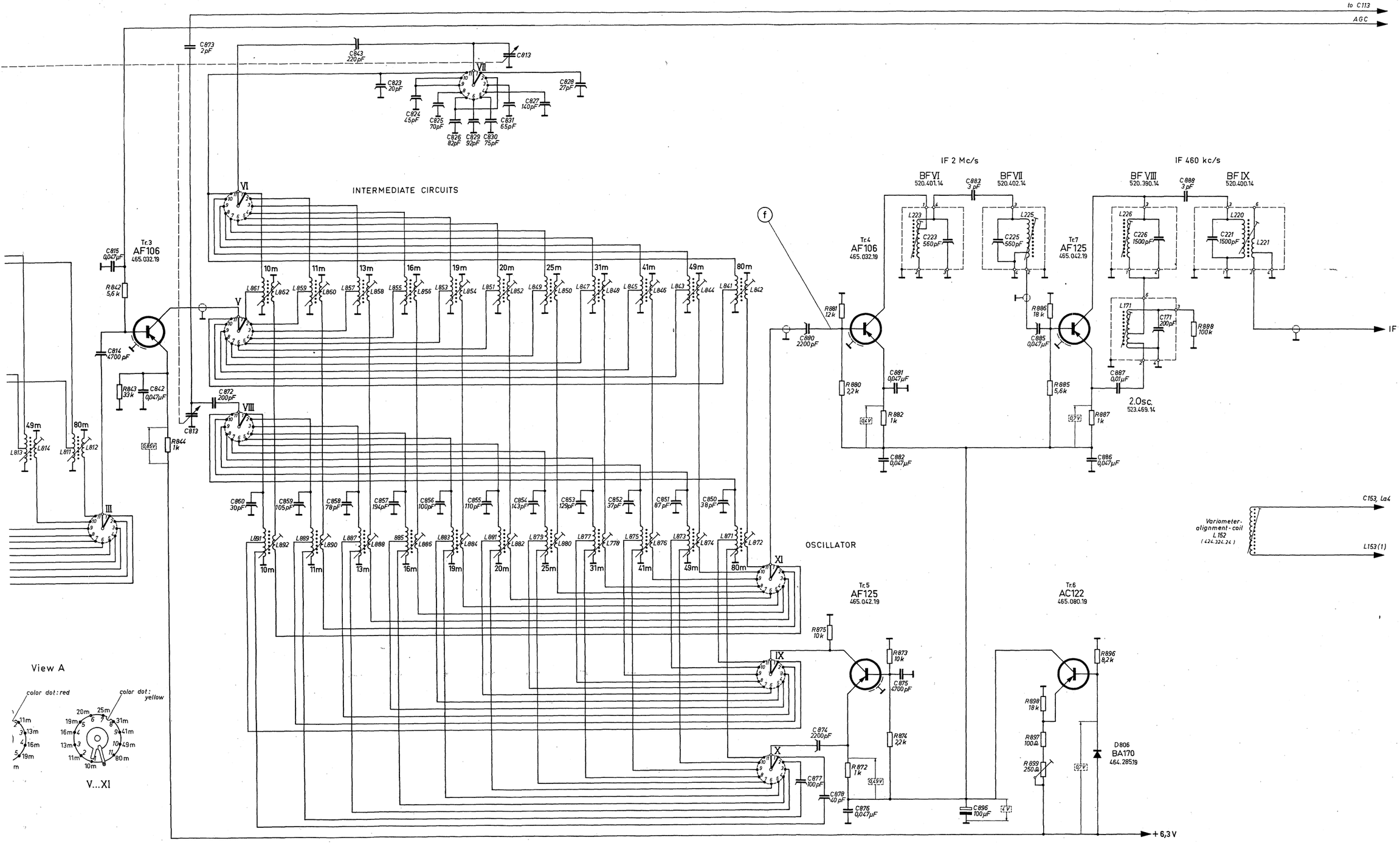


	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857
C	10pF R500–		20pF KS160–	45pF KS160–	68pF KS160–	82pF KS160–	127pF KS160–	27pF KS160–				280pF KS160–	Tun.cond. 446.056	4700pF W30/90	0,047µF S12–								20pF KS160–	4,6 pF KS160–	70pF KS160–	82pF KS160–	140pF KS160–	27pF KS160–	92pF KS160–	75pF KS 63–	65pF KS160–										0,047µF S12–	220pF KS160–								38 pF R500–	87 pF R500–	37 pF R500–	129pF R 500–	143pF R 500–	110pF R 500–	100pF R 500–	194 pF R 500–
R															5,6k 0,125W	33k 0,125W	1k 0,125W																																															
L												424.360	424.360	424.361	424.361	424.362	424.362	424.363	424.363	424.364	424.364	424.365	424.365	424.366	424.366	424.367	424.367	424.368	424.368	424.369	424.369	424.370	424.370									424.371	424.371	424.372	424.372	424.372	424.373	424.373	424.374	424.374	424.374	424.375	424.375	424.376	424.376	424.377	424.377	424.378	424.378	424.379

	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	BF VI 223			BF VII 225			BF VIII 226			BF IX 220	221		171		152
C	78 pF R500–	105pF R500–	30pF R500–												200pF KS160–	2pF P 500	2200pF KS63–	4700pF W 30/90	0,047µF W 30/90	150pF KS 63–	47pF KS160–		2200pF KS 63–	0,043µF S12–	0,047µF S12–	3pF P500–		0,047µF S12–	0,047µF S12–	0,01µF KT160–	3pF P500–							100pF 443.309				560pF KS25–			560pF KS25–			1500pF KS25–				1500pF KS25–		200pF KS25–		
R															1k 0,125W	10k 0,125W	2,2k 0,125W	10k 0,125W					2,2k 0,125W	12k 0,125W	1k 0,125W			5,6k 0,125W	18 k 0,125W	1k 0,125W	100 k 0,125W							8,2k 0,125W	100Ω 0,125W	18 k 0,125W	250Ω 402.656																				
L	424.379	424.380	424.380	424.381	424.381									424.382	424.382	424.383	424.383	424.384	424.384	424.384	424.385	424.385	424.386	424.386	424.387	424.387	424.388	424.388	424.389	424.389	424.390	424.390	424.391	424.391	424.392	424.392							424.328			424.329			424.156			W1 424.204	W II 424.204		424.330		424.324

LEGEND OF CAPACITORS: KS=TROLITUL, KT=POLYESTER, P,R,S a. W=CERAMIC. VOLTAGE MEASUREMENTS WERE CARRIED OUT BY MEANS OF A 50000Ω/V VOLTMETER IN THE RANGE OF 3 RESPECTIVELY 10V.

Subject to change



	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857
	75pF KS 63-	65pF KS 160-											0,047µF 5 12-	220pF KS 160-							38 pF P 500-	87 pF P 500-	37 pF P 500-	129pF P 500-	143pF P 500-	110pF P 500-	100pF P 500-	194 pF P 500-
													5,6k 0,125W	33k 0,125W	1k 0,125W													
	424.369	424.370	424.370									424.371	424.371	424.372	424.372	424.373	424.373	424.374	424.374	424.374	424.375	424.375	424.376	424.376	424.377	424.377	424.378	424.378

	887	888	889	890	891	892	893	894	895	896	897	898	899	BF VI 223			BF VII 225			BF VIII 226			BF IX 220	221		Osc. 171		152
	0,01µF KT 160-	3pF P 500-								100µF 443.309				560pF KS 25-			560pF KS 25-			1500pF KS 25-				1500pF KS 25-			200pF KS 25-		
	1k 0,125W	100k 0,125W								6,2k 0,125W	100Ω 0,125W	18k 0,125W	250Ω 402.656																
	424.390	424.390	424.391	424.391	424.391	424.392	424.392							424.328			424.329			424.356			W1 424.206	W11 424.206		424.330		424.324

./V VOLTMETER IN THE RANGE OF 3 RESPECTIVELY 10V.

Subject to change!

NORDMENDE

SW-BANDS TUNER

8/101 F

184.374.18

Alignment Procedure for SW-bands

Operating point: Depress button "BANDS" and adjust stabilized voltage of Tr. 4, 5 and 7 with control **R 899** to 4 V with instrument across capacitor **C 896 .**

IF-Alignment: Turn on volume control. Connect signal generator (input frequency = 2 Mc/s) over 10 nF on **point (f).** Adjust **2,46 Mc/s** oscillator to maximum by **L 171.** Then align **BF VI, VII, VIII** and **IX** to **max. output.** Connect signal generator by antenna jack **V 101,** telescopic antenna pushed-in. Adjust dial indicator to range center.

Calibrating: Switch-in the **49-m-band.** Turn tuning capacitor inwards. Crystal controlled calibration frequency = **5,9 Mc.** Adjust **L 873/874** to maximum.
Set Signal generator (crystal controlled) to **6,1 Mc** and turn tuning capacitor until RF-input frequency of **6,1 Mc** is received.

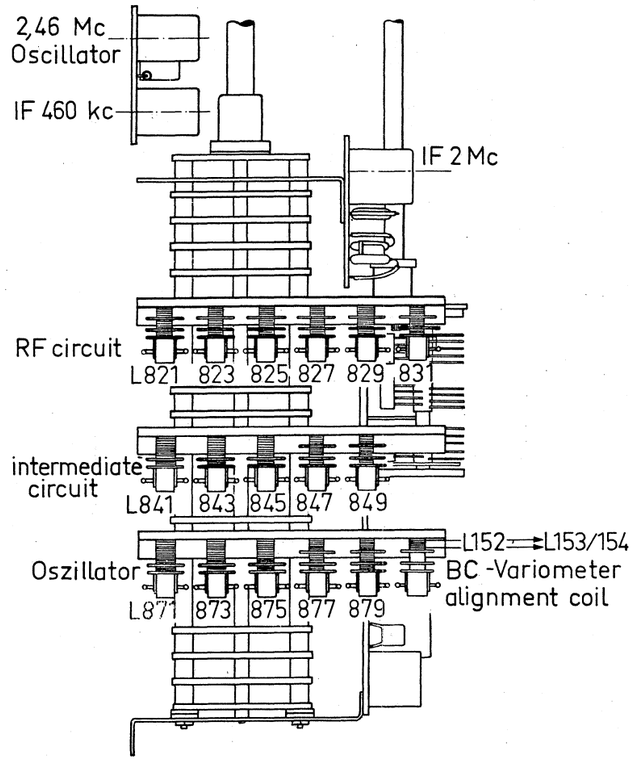
Attention!

The tuning capacitor position now found is being used during alignment on all SW-ranges and should not be changed. Set dial pointer to the gauge mark at **6,1 Mc.**

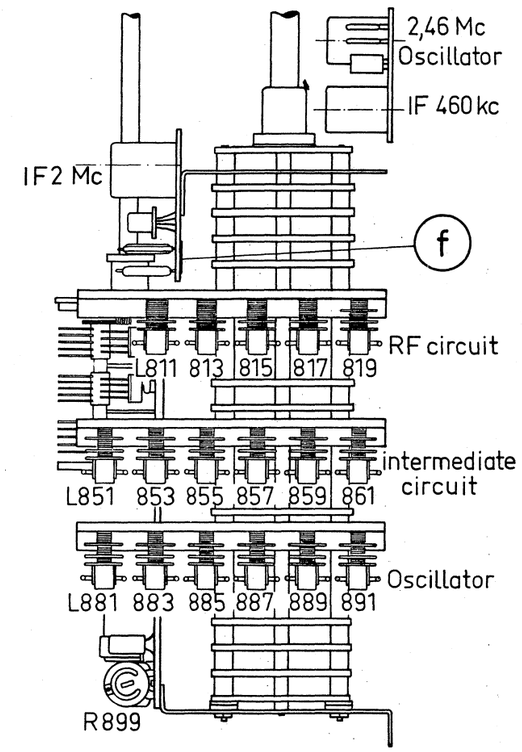
Alignment: The oscillator coil O,
the intermediate coil I and
the RF-circuit R
of the following ranges have to be adjusted to maximum with the stated coils L.../...
Reduce generator RF-output continuously in order to find the alignment optimum.

80-m-band		
Range 3,48 ... 4,06 Mc	O	L 871/872
Tie-down-point 3,78 Mc	R	L 811/812
	I	L 841/842
49-m-band		
Range 5,86 ... 6,3 Mc	O	L 873/874
Tie-down-point 6,1 Mc	R	L 813/814
	I	L 843/844
41-m-band		
Range 6,9 ... 7,41 Mc	O	L 875/876
Tie-down-point 7,17 Mc	R	L 815/816
	I	L 845/846
31-m-band		
Range 9,4 ... 9,86 Mc	O	L 877/878
Tie-down-point 6,1 Mc	R	L 817/818
	I	L 847/848
25-m-band		
Range 11,59 ... 12,07 Mc	O	L 879/880
Tie-down-point 11,85 Mc	R	L 819/820
	I	L 849/850
20-m-band		
Range 13,88 ... 14,44 Mc	O	L 881/882
Tie-down-point 14,18 Mc	R	L 821/822
	I	L 851/852
19-m-band		
Range 14,82 ... 15,58 Mc	O	L 883/884
Tie-down-point 15,3 Mc	R	L 823/824
	I	L 853/854
16-m-band		
Range 17,6 ... 18 Mc	O	L 885/886
Tie-down-point 14,18 Mc	R	L 825/826
	I	L 855/856
13-m-band		
Range 20,82 ... 21,92 Mc	O	L 887/888
Tie-down-point 21,42 Mc	R	L 827/828
	I	L 857/858

SW-bands tuner



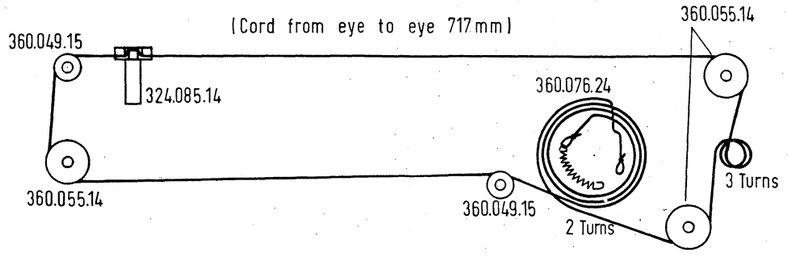
SW-bands tuner



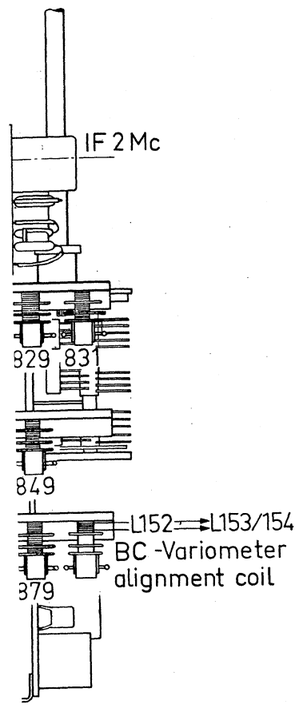
11-m-band		
Range 25,35 ... 26,4 Mc	O	L 889/890
Tie-down-point 25,9 Mc	R	L 829/830
	I	L 859/860
10-m-band		
Range 26,8 ... 29,9 Mc	O	L 891/892
Tie-down-point 28,45 Mc	R	L 831/832
	I	L 861/862

Observe at image-frequency test:
In the 80-, 49-, 31-, 25-, and 20-m-band the oscillator works **above** input frequency and in the other bands **below** input frequency.

Cord drive for drum type dial



s tuner

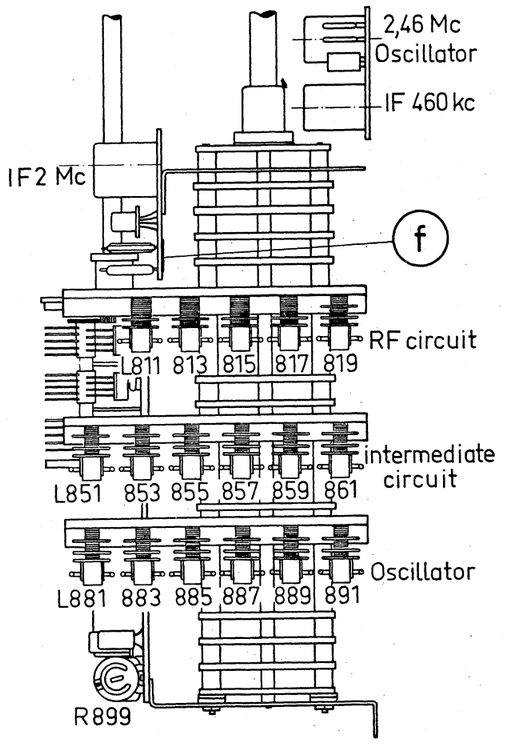


O L 889/890
R L 829/830
I L 859/860

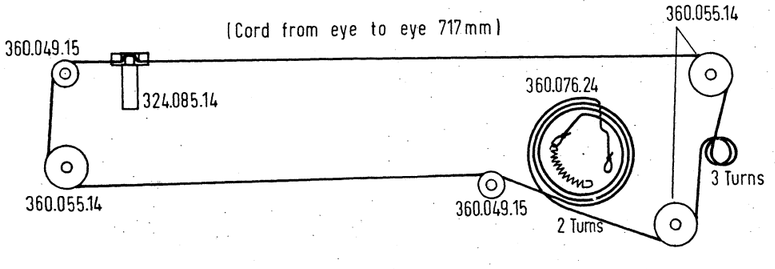
O L 891/892
R L 831/832
I L 861/862

oscillator works **above**
below input frequency.

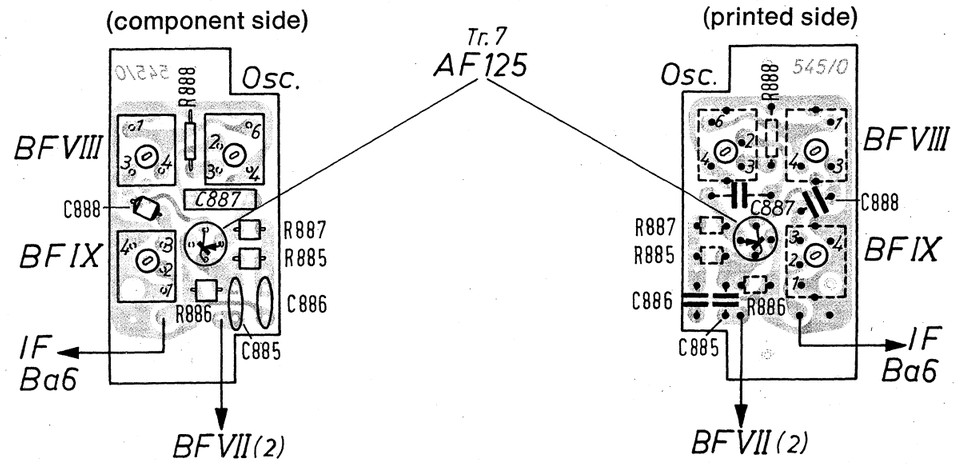
SW-bands tuner



Cord drive for drum type dial



Printed boards SW-bands tuner



Printed boards SW-bands tuner